1.0 INTRODUCTION

The Tooele Chemical Agent Disposal Facility (TOCDF) was designed and built for the United States Army to destroy the chemical agent munitions stockpile at the Deseret Chemical Depot (DCD) located 20 miles south of Tooele, Utah. The TOCDF uses four hazardous waste incinerator systems consisting of two Liquid Incinerators (LIC1 and LIC2), the Metal Parts Furnace (MPF), and the Deactivation Furnace System (DFS). EG&G Defense Materials, Inc. (EG&G) operates the TOCDF under contract to the Army through the Chemical Materials Agency (CMA).

The United States Environmental Protection Agency (EPA) identification number for the TOCDF is UT5210090002. The facility operates under a Resource Conservation and Recovery Act (RCRA) Part B permit issued pursuant to the delegation of the State of Utah, Department of Environmental Quality, Division of Solid & Hazardous Waste (DSHW) under the Utah Administrative Code Section 315. The TOCDF also operates under a Title V permit administrated by the State of Utah, Department of Environmental Quality, Division of Air Quality (DAQ). Under the requirements of these permits, the incinerator system must demonstrate an ability to effectively treat any hazardous waste such that human health and the environment are protected.

Munitions stored at DCD include spray tanks filled with Agent VX. The spray tanks were designed to be mounted on the underside of aircraft and allow the aircraft to disperse the agent over the selected area. The MPF Agent Trial Burn (ATB) developed an operating envelope to cover the processing of agent in munitions to be processed in the MPF. The spray tanks contain 81 pounds of lead in the nose cone of the spray tank to assist in aircraft handling when the tank is attached. The nose cone cannot be easily separated from the rest of the spray tank structure. Therefore, the tank will be processed through the MPF with 81 pounds of lead in the nose cone and 1.6 pounds of lead in the paint on the exterior of the spray tank for a total of 82.6 pounds of lead per charge to the MPF. An MPF Spray Tank Demonstration Test (STDT) is planned to demonstrate the lead emissions from thermally processing spray tanks do not exceed the emissions rates used in the Human Health Risk Assessment (HHRA) published in 2002. Any issues or problems identified during the MPF VX ATB will be resolved and approved by DSHW before starting the MPF STDT.

This Plan addresses the sample collection and analyses for the MPF STDT. The sampling and analysis methods used in this Plan are taken from SW-846 (1), Title 40, Code of Federal Regulations, Part 60 (40 CFR 60), Appendix A (2) and TOCDF Laboratory Operating Procedures (TE-LOP).

1.1 DEMONSTRATION TEST PLAN ORGANIZATION

This plan is a stand-alone document to allow review separately from the TOCDF permits. The plan describes the operating conditions for the testing and the samples to be collected as part of the MPF STDT. The Quality Assurance Project Plan (QAPP) describes the sampling and analyses to be conducted and is found in Appendix A. Appendix B provides calculations showing the lead emissions from processing spray tanks are not a threat to human health or the environment. Appendix C contains a copy of a report on the laboratory thermal treatment of the nose cones containing lead. The Automatic Waste Feed Cutoffs (AWFCOs) are summarized in Appendix D.

This introduction provides an overview of the plan, including the following:

- Wastes to be treated
- MPF STDT objectives
- MPF STDT approach
- Expected final permit conditions resulting from the MPF STDT

1.2 WASTES TO BE TREATED

The MPF is used to thermally treat munitions and wastes to remove any organic compounds present. The MPF STDT will demonstrate thermal treatment of drained Agent VX spray tanks. A vent hole is drilled in the nose cone to prevent over-pressurization during thermal treatment of the spray tank. Spray tanks contain 81 pounds of lead in the nose cone and 1.6 pounds of lead in the paint on the exterior of the spray tank for a total of 82.6 pounds of lead. Spray tanks will be drained to less than a 5% heel. Spray tanks will be drained to 1.1 inch or less at the bulk drain station. A depth of 1.1 inch of agent in a spray tank corresponds to 22 pounds of agent. Agent feed rates are anticipated to be 22 pounds/charge (lbs./charge). The normal spray tank feed interval is 43 minutes, but the STDT will be conducted at 54 minutes or more to comply with the MPF VX ATB 75% hourly feed rate restrictions from the MPF VX ATB. Also, the minimum spray tank residence time in the MPF primary chamber will be 67 minutes, consistent with the 5x criteria for spray tanks. A feed interval of 54 minutes would result in an hourly feed rate of 24.4 lbs./hr compared to the 24.75 lbs./hr from the MPF VX ATB 75% agent feed rate restriction.

Limited amounts of lead from the spray tank nose cones will partition to the exhaust gases and be removed from the gas by the wet scrubber recirculation brine (Brine) in the MPF Pollution Abatement System (PAS). Therefore, the lead is considered an embedded metal. Lead emissions from the lead in the paint will be controlled by the PAS. Lead in the paint could migrate to the Brine and increase lead concentrations. Lead emissions from both sources are not expected to exceed the lead emission rates used in the HHRA based on calculations shown in Appendix B. Additional information supplied in Appendix C on thermal testing of the nose cones supports the fact that lead will not be volatilized during thermal treatment in the MPF.

1.3 MPF STDT OBJECTIVES

The objective of the MPF STDT is to demonstrate the ability of the MPF to effectively treat hazardous waste such that human health and the environment are protected. The STDT will consist of three runs processing spray tanks containing a heel of 22 lbs. or less of Agent VX, 81 pounds of lead in the nose cone, and 1.6 pounds of lead in paint on the exterior of the spray tank. The objectives are further defined as follows:

- Demonstrate that lead emissions from lead in the exterior paint and from the nose cone of spray tanks will not exceed emission rates used in the DCD HHRA.

- Conduct exhaust gas emissions testing for metals used in the HHRA and total phosphorus using sampling method EPA Method 29 (2) and analysis methods SW-846, modified Method 6020 and Method 7470A (1). The HHRA metals include: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), mercury (Hg), manganese (Mn), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), tin (Sn), vanadium (V), and zinc (Zn). The objective of these measurements is to assess the metal emission rates.

- Determine exhaust gas characteristics: volumetric flow rates, mass flow rates, molecular weight, temperatures, pressures, and moisture. Develop exhaust gas characteristics to allow calculation of emission rates.

- Conduct exhaust gas emissions testing for oxygen (O_2) and carbon monoxide (CO) using the TOCDF Continuous Emission Monitoring Systems (CEMS). The CO results will be reported as an hourly rolling average in parts per million (ppm) corrected to 7% O_2.

- Determine the O_2 and carbon dioxide (CO_2) concentrations using an Orsat analysis as described in Method 3 (2). This data will be used to calculate the molecular weight of the exhaust gas and calculate the velocity of the exhaust gas in the duct.

- Conduct exhaust gas emissions testing for particulate matter (PM) as a demonstration that PM emissions from processing spray tanks does not exceed the PM emissions measured during the MPF VX ATB. Samples will be collected and analyzed by Method 5 (2).

- Collect Brine samples to determine if the lead is collected in the PAS.

The objectives of the measurements taken are to obtain data that represent the monitored sample or operation. Experienced personnel, use of EPA approved sampling and analysis methods, good sampling techniques, properly calibrated sampling equipment, and adequate documentation are required to meet these overall objectives. Quality assurance of the sampling and analysis methods and Data Quality Objectives (DQO) are discussed in Appendix A. These DQOs were developed for the exhaust gas and process samples.

1.4 SPRAY TANK DEMONSTRATION TEST APPROACH

The MPF STDT will take the universal approach outlined in EPA Guidance (3). The universal approach establishes one set of permit conditions or limits applicable to all feed materials. This approach will allow the TOCDF to treat spray tanks in the MPF while confining the incinerator's operation to a well-defined set of operating limits or an operating envelope. The MPF STDT will demonstrate the lead in the nose cone of the spray tanks should be considered an embedded metal since it will not significantly partition to the exhaust gases. This statement is supported by the calculations in Appendix B that show that less than 0.2 grams of the lead will migrate from the nose cone during processing in the MPF. The MPF STDT will demonstrate spray tanks with lead in the nose cones can be treated safely without posing a threat to human health and the environment.

1.5 FINAL PERMIT LIMITS

Anticipated permit operating conditions resulting from the STDT testing are an increase in the lead feed limits to the MPF. Results of the STDT will establish a lead feed limit of 82.6 pounds per charge based on 81 pounds of lead in the nose cone and 1.6 pounds of lead in the paint on the exterior of the spray tank. This testing will demonstrate that the lead emissions from lead in the exterior paint and from the nose cone of spray tanks will be less than the emission rates used in the DCD HHRA. The STDT will show the spray tanks can be processed without being a threat to human health or the environment.